



Australian Government

Department of Climate Change, Energy,
the Environment and Water

National Energy Workforce Strategy

Consultation Paper

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CONSULTATION PAPER – JULY 2024
National Energy Workforce Strategy

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Acknowledgement of Country

We acknowledge the Traditional Owners of Country throughout Australia and recognise their continuing connection to land, waters, and culture. We pay our respects to their Elders past and present.

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We want to hear from you

To better guide government policy, the Department of Climate Change, Energy, the Environment and Water (DCCEEW) is seeking responses on key energy workforce issues. DCCEEW has been tasked by state and territory Energy Ministers to build a stronger understanding of issues facing the energy workforce as we move to a clean energy economy.

We would like to invite you to share your ideas and experiences on how to grow the clean energy workforce to deliver on our emissions reduction commitments and provide more Australians with opportunities to secure clean energy jobs and share the benefits of the clean energy transition.

Consultation themes

In particular, the consultation paper is seeking responses to three workforce themes identified from initial consultations with state and territory officials, industry and union representatives:

- **Attracting and retaining:** We are seeking to understand how coordinated effort across multiple portfolios can further grow and promote the clean energy workforce and opportunities for appropriate training, skilled migration, regional workers and ensuring quality and rewarding jobs.
- **Workforce data and information:** We want to understand how workforce data can be better sourced, used and shared to better inform decision making and planning.
- **Improving coordination:** We are seeking to identify further coordination needs across the Commonwealth, states and territories to facilitate a joined-up approach to the clean energy workforce challenges.

How to share your views

This consultation paper includes questions at the end of the discussion of each workforce theme. A response can be made to any, or all, questions by completing the survey on the department's *Have Your Say* portal - [National Energy Workforce Strategy](#). Responses can be submitted through the portal by Saturday 31 August 2024.

Introduction

Meeting the Australian Government’s greenhouse gas emission reduction targets of 43 per cent below 2005 levels and reaching net zero by 2050 will require a growing, skilled workforce across clean energy supply, demand and enabling occupations. The Jobs and Skills Australia (JSA) *The Clean Energy Generation: workforce needs for a net zero economy* report (the Clean Energy Capacity Study) estimates that across 38 critical clean energy occupations, workforce needs will grow from under 1.6 million to over 1.8 million workers by 2030, and 2.25 million by 2050. The highest rate of workforce growth is anticipated in regional areas.

Modelling for the Clean Energy Capacity Study suggests that without actions to boost training and skills, several critical occupations will experience severe shortages, particularly in trade and technical occupations such as electricians, plumbers, and telecommunications trades. The government’s commitment to make Australia a renewable energy superpower through the Future Made in Australia package will further increase workforce needs, possibly exacerbating projected shortfalls.

Addressing clean energy workforce needs is a challenge. Skills shortages are already reported in Australia and internationally and are expected to worsen in key trades for the energy transition as many countries around the world work to transform their energy systems and reduce their emissions. In addition, many of the trades required for clean energy are also needed to address other needs, such as construction of housing.

The government’s plan for a Future Made in Australia is aimed at creating secure, well-paid jobs and delivering benefits to communities across the country. The high demand for workers presents an opportunity for many Australians to benefit from the clean energy transition. This could include increased engagement of previously underrepresented workers, including women, First Nations Peoples, the Culturally and Linguistically Diverse (CALD) and people with a disability, as well as workers in regional areas and those transitioning from high-emissions industries. As well as providing good jobs for Australian workers, the clean energy transition provides a valuable opportunity to diversify our energy workforce, bring more employment to regional areas and to progress social objectives such as Closing the Gap and Gender Equality.

Strategy Framework

Our Plan

In the October 2022 Energy Ministers’ Meeting, Ministers agreed DCCEEW would develop a National Energy Workforce Strategy (NEWS), working with state and territory governments through the National Energy Transformation Partnership (NETP).

The NEWS will:

- build on existing workforce resources to identify current and future skills gaps in the energy sector and help plan for energy workforce needs
- provide a national framework for coordinating existing and planned workforce-initiatives from the Australian, state and territory governments
- foster an environment that enables the clean energy workforce to grow, adapt and build the skills and capability we need to reach net zero emissions by 2050
- build on the work of Jobs and Skills Australia through the Clean Energy Capacity Study while not undertaking additional workforce projections.

NEWS Vision		
Ensure Australia has the workforce it needs to meet its net zero ambitions		
NEWS Objectives		
Attract, enable and retain	Improve information	Coordination
<ul style="list-style-type: none"> • Support for education and training • Support for access/equity • Promote/attract workers 	<ul style="list-style-type: none"> • Identify key data gaps • Addressing gaps through the development of new data collection initiatives 	<ul style="list-style-type: none"> • Map and monitor existing work • Collaborate and communicate • Commit to ongoing review and improvement
Outcomes		
<ul style="list-style-type: none"> • Reduced worker shortfalls in critical clean energy occupations • Increased awareness of clean energy career opportunities • More people training for high demand clean energy careers • Increased retention in clean energy occupations • More people in regional and remote areas in clean energy careers • Greater diversity in clean energy workers • Improved labour mobility • Strong data and information base for workforce planning • Increase social licence for the energy transformation • All levels of government working together 		
Commonwealth, state and territory collaboration on		Underpinned by
<ul style="list-style-type: none"> • Training • Mobility • Data sharing • Access • Awareness • Retention 		<ul style="list-style-type: none"> • Ongoing collaboration across all levels of government and industry • Ongoing collaboration and consultation with industry, unions and state and territory governments

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	<ul style="list-style-type: none">• Ongoing workforce monitoring and engagement• Annual review and updates
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Scope of the Strategy

The NEWS will be a foundational strategy for the government to direct clean energy workforce reforms for 2025-2030. The scope of the NEWS will be targeted towards key occupations and issues that have been identified through the work of JSA and early consultations for this period.

Occupations

For the purpose of the NEWS, the clean energy workforce encompasses occupations engaged in the below categories of clean energy:

- Clean energy supply - designing, developing, constructing, and operating the infrastructure for generating, producing, storing, transmitting and distributing energy from renewable, zero or low emissions energy sources, both for domestic use and export.
- Energy performance/demand - reducing or managing the energy required to deliver energy services, such as energy efficiency, electrification, energy management, and demand management.
- Clean energy enabling – enabling services such as training and research relating to clean energy.

Out of scope workers are those with skill sets less specific to the clean energy sector. It includes workers who support but are more indirectly involved in clean energy, are a relatively small proportion of the workforce and/or occupations that work primarily in other sectors. For example, lawyers, accountants, drivers, administration and retail assistants, agriculture, and manufacturing workers.

Issues

There are a number of issues that impact directly on the clean energy workforce in scope for the NEWS. These include:

- Coordination between governments
- Workforce data
- Skills shortages
- Attraction retention and redeployment
- Training and education pathways for current and emerging occupations and technology
- Energy generation, transmission and energy demand workers
- Improved industry and worker engagement
- Regional workforce needs and challenges
- Diversity and inclusion

To meet workforce needs there will be opportunities for workers from high emissions industries to transition into the clean energy sector. Support and planning for these workers and communities will be led by the Net Zero Economy Agency (NZE) and Department of Workplace Relations (DEWR), and the NEWS will seek to compliment, not duplicate, these efforts (see **Appendix A** for further detail).

We have also heard from the targeted consultations held across government, with industry and the unions, there are number of broader issues impacting the clean energy workforce, such as the availability of housing and childcare. As these issues are currently felt most acutely in regional areas, the clean energy workforce is particularly impacted. While the NEWS will articulate a need for

addressing these issues, they cannot be addressed in isolation for the clean energy workforce and will require regional focused cross portfolio solutions.

Strategy Context

A number of broader themes are impacting the clean energy workforce. Our need for a robust pipeline of skilled workers comes at a time of low unemployment and a high demand for skilled workers across the economy. This will require a focus on opportunities to increase productivity and diversity. We will also need to do this regionally, with many employment opportunities to be located in regional areas.

Building the clean energy workforce is a cross portfolio issue, requiring policy development from a range of portfolios. The NEWS will seek to build on the substantial efforts already underway across the government. An overview of government investment in clean energy and skills and training can be found at **Appendix A**.

Skilled worker shortages

Australia is currently experiencing low unemployment rates and skilled worker shortages across the economy. Similar shortages are occurring internationally as workers in critical occupations are in high demand world-wide with global worker shortages across energy, healthcare, transport, retail, manufacturing, construction, and information and communications technology sectors. This competition for workers creates a significant challenge for growing the clean energy workforce. For sustained growth, the sector will need to attract and retain more workers, including from overseas.

Productivity

The clean energy transformation provides an opportunity to accelerate investment in innovation, capital, and communities, creating new opportunities for productivity growth, with the potential to lower costs for businesses and households.

As the government channels its efforts into driving up productivity, issues such as job mobility, worker entitlements and conditions will be particularly important for the clean energy workforce. The transformation also provides an opportunity for workers to upskill and move into new and higher paid roles, increasing productivity across the economy.

Opportunity for diversity

Attracting and retaining new skilled workers by reducing barriers to training and incentivising employers to support more training of workers including apprentices is a key priority for growing the clean energy workforce. One challenge is some demographics have low levels of participation in clean energy occupations, with clear barriers to participation.

The Clean Energy Capacity Study found increased participation by women will be particularly critical to ensuring the clean energy sector can grow at the scale required for achieving net zero. Highly gendered occupations are more vulnerable to shortages, and many of the occupations identified as key to the clean energy transformation are currently male dominated.

CALD workers are also critical to addressing skills and labour shortfalls in the clean energy workforce. In particular, skilled migrants can face additional challenges in entering the workforce in Australia,

such as delays and costs associated with skill recognition and lack of local experience. This can result in underemployment of skilled workers and further exacerbate skills shortfalls in the economy.

The clean energy transformation also presents an opportunity to increase participation by First Nations Peoples in this workforce, providing employment opportunities in regional areas. However, skills and training opportunities need to be available in these areas if these opportunities are to be fully realised.

Supports regional growth

Growth in demand for workers in the clean energy sector is anticipated to be higher in regional areas. This presents a strong opportunity for regional and remote areas to benefit from the net zero transformation with access to new clean energy careers.

However, this is not without challenges. Infrastructure, housing, and services can be limited in regional areas making it difficult to accommodate a growing population and attracting new workers. Local skills and training opportunities are often limited especially in highly specialised fields, and future demand can be uncertain, particularly long term. It is also critical to ensure workers in emission intensive industries and their communities are supported to benefit from the transition, including access to opportunities in clean energy careers.

Attract and Retain

The clean energy workforce will need to grow significantly to meet Australia’s targets of 82% renewable electricity and a reduction of emissions by 43% below 2005 levels by 2030, and net zero by 2050. This includes workers to design, construct and operate renewable energy generation, transmission, and storage capacity, as well as workers to change the size and shape of demand through improved energy performance and the use of smart energy systems.

With only a short timeframe for delivery, the period from now until 2030 is particularly important. Worker shortfalls are already a concern economy-wide and are projected by JSA to be an issue for at least 18 critical clean energy occupations without concerted and coordinated actions by governments.

While the period to 2030 is the priority of the NEWS, attracting and retaining workers in the sector long term is also vital. Workforce demand in the sector is anticipated to grow further to 2050, and more will be needed to deliver the government’s Future Made in Australia agenda.

There are a range of barriers and challenges impeding workforce growth. These include:

- A perception that clean energy jobs can be insecure, with limited benefits and modest pay, compounded in specific regions by the fact pay and conditions may be lower than in higher emission industries.
- Information gaps including low awareness of clean energy occupations, career pathways and regulatory obligations. This uncertainty can result in people being unaware of what, where and when opportunities will exist, and what training, competencies and experience are required.
- Limited training capacity, including a need for more trainers, suitable facilities, courses and equipment, apprenticeship places and regional training opportunities.
- Location, which may be in remote or regional areas with limited infrastructure.
- Low unemployment and high demand creating competition for skilled workers.
- Domestic and international worker mobility challenges due to delays and/or costs associated with skill recognition and licencing due to differences between requirements.
- Workplace culture and safety issues, particularly for underrepresented groups including women and First Nations peoples.
- Temporary and mobile nature of positions during the construction phase of renewable energy and transmission projects.
- Limited local housing, services and infrastructure, particularly in regional and remote locations.
- Perceptions and pursuit of critical occupations and fields of study, including trades and STEM. This can include preferential views of university study over trades, and gendered perceptions of occupations.

Progress has been made to address some of these issues with interventions from both government and industry (see **Appendix A** for government investment in skills and training). This includes actions to communicate clean energy careers, such as the Clean Energy Council and Energy Efficiency Council ‘Careers for Net Zero’ initiative, investment in the VET sector, the Home Affairs Migration Strategy, efforts to improve data and map skills, specific programs to engage and support underrepresented cohorts and direct engagement with local regional communities.

However, more needs to be done to address projected workforce shortfalls, employment conditions and training. The NEWS seeks to identify opportunities to further attract and retain workers, including identifying unaddressed issues and opportunities, areas for further investment, areas that would benefit from national coordination and successful projects and programs that could be expanded.

Consultation Questions

1. What do you consider to be the main barriers to growing the clean energy workforce? What actions can be taken to overcome these barriers and attract more workers to the sector?
2. What could be done to attract more First Nations people as well as underrepresented groups, such as women, Culturally and Linguistically Diverse (CALD) people and people with a disability to the sector and address barriers to greater participation?
3. What skills or qualifications are most in demand for clean energy roles, and how can education and training programs better align with these needs?
4. What actions are needed to ensure the clean energy workforce has appropriate skills, competencies and qualifications relating to safety?
5. What actions are needed to ensure clean energy jobs offer attractive pay and conditions, security, and safety?
6. What remaining barriers are there to increasing training capacity for clean energy occupations, particularly in regional areas that are not being addressed, or require more intervention?
7. Do you consider worker retention in the clean energy sector to be a concern? If yes, what would help to retain more workers, particularly women?
8. What actions could help to reduce the risk of bias and harassment in the workplace?
9. Do you think there is a need to improve ease of mobility of workers between states or from overseas? If yes, what could be done to improve mobility?
10. Does skilled migration help address workforce or expertise shortfalls? If Yes, what are the barriers to engaging overseas workers that need to be addressed?

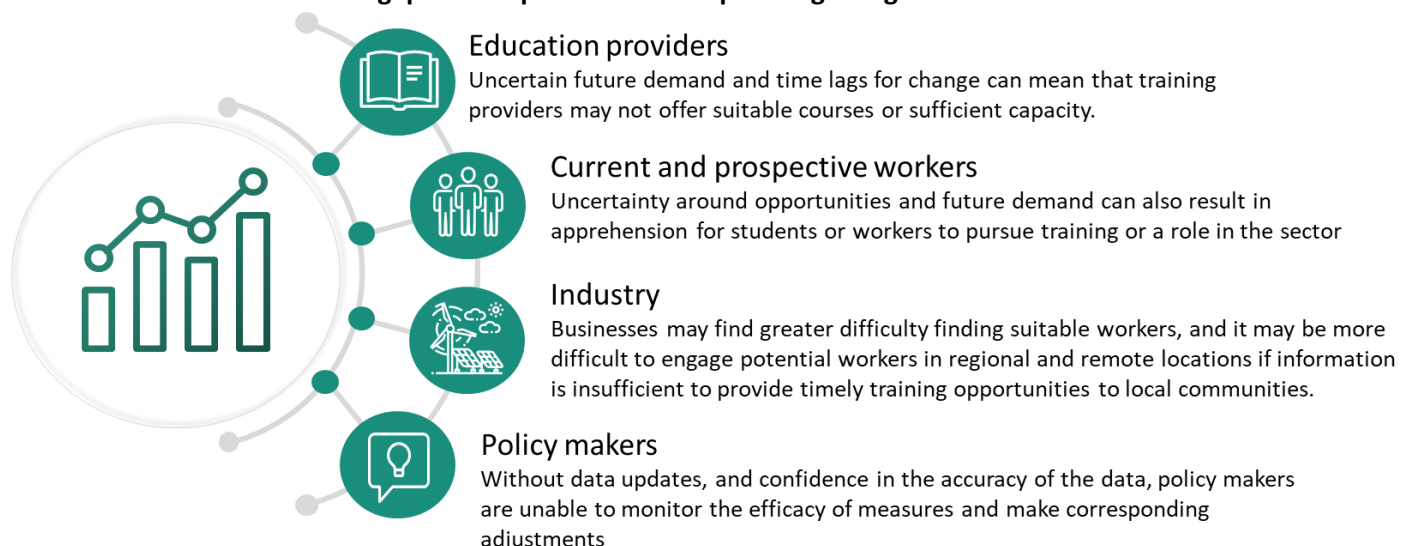
Workforce Data and Information

Meeting the skills needs of Australia’s energy transformation, and the broader economic imperative of achieving net zero will require a substantial change in the size and structure of the energy workforce. This will require significant workforce planning to ensure we have the right skills coming through at the right time and in the right places. The availability and collection of relevant and robust energy workforce data is critical to ensure policies are able to support this transition.

The Clean Energy Capacity Study provides a valuable basis for our understanding of the current and future clean energy workforce. However, this was a one-off exercise and as highlighted by both JSA and many stakeholders, this study is not without its limitations, and significant data gaps remain. This includes:

- Confirmation on the proportion of the workforce working in clean energy.
- Granular region-specific worker supply and demand data.
- Up to date national and regional worker supply and demand projections/mapping.
- Clear clean energy career opportunities and pathways.

Data and information gaps can impede workforce planning and growth for all stakeholders



Filling these data and information gaps is currently challenging. Current barriers include:

- Lack of clean energy sector identification in ABS ANZSCO occupation codes.
- Diversity of occupations, with a highly diverse mix occupations shared with other sectors.
- Workers may also work across sectors or are difficult to identify due to the nature of their work. For example, an electrician may do both ‘clean energy’ work such as electrification and energy efficiency upgrades of homes, as well as other household electrical work.
- Uncertainty as to future demand over time in skills, sectors and locations.
- Limitations in other data collection sources, such as VET data and census data.
- Lack of historical data as a basis, as the sector is new, growing rapidly and likely to change over time due to changing technology, different stages of implementation and policy interventions.
- Absence of ongoing resources and mechanisms for data collection, analysis and dissemination.

Initial consultation has highlighted a strong desire for improved data on the clean energy workforce. Of particular interest is more sector-specific and location-specific workforce data, future workforce mapping and clearer information on career pathways. Some industry organisations and state and territory governments have advised they are working to address data gaps relevant to their region and sector. However, many also highlighted remaining barriers, and the benefits of further investment for improved workforce planning and growth.

Consultation Questions

1. How far ahead of time are businesses able to anticipate the workforce needed for a clean energy project/development? Is this type of data something that could be provided to government for planning purposes?
2. What work has been undertaken by industry and unions to project/estimate clean energy worker/skill demands ahead of time, particularly for local study/training/recruitment purposes?
3. What qualitative and quantitative data have you collected/do you plan to collect relating to the clean energy workforce? Are there data sources available that are new or underutilised?
4. Are there any data limitations that restrain the planning and/or progression of clean energy projects or precincts?
5. What data or information would help with workforce planning? Why is this data needed? This could include more detailed data on the current workforce and/or analysis of future workforce needs.

Coordination

Reaching net zero, reducing emissions and growing renewable energy generation will require a coordinated effort across governments, industry, unions, communities, and the education sector. All state and territory governments have committed to timeframes for achieving net zero by or before 2050, each with different challenges to face. The industry stakeholders critical to the clean energy transformation span across many sectors, including energy supply, demand, carbon lifecycle and transitioning industries. Finally, the tertiary sector will be crucial to training and upskilling workers in clean energy occupations.

This creates a complex policy environment with actions required across multiple portfolios, including skills and training, energy investment and regulation, employment, and migration. Such complexity can be a barrier to action, a source of confusion and can increase the amount of time and resources required for participants to navigate. This can deter participation and increase the risk of duplication and unaddressed issues.

Many actions, plans and policies are well underway and reflect individual and shared objectives, responsibilities, and different stages.

- The National Skills Agreement is shifting the way governments work together with a new stewardship model, with the clean energy transition as a national priority.
- Jobs and Skills Councils are tripartite in nature, bringing together employers, unions and government as they work to understand and address skills and workforce needs for their sectors, map career pathways, develop contemporary VET products and act as a source of intelligence on issues affecting workforces, including clean energy occupations and the net zero transition.
- TAFE centres of excellence will increase collaboration between TAFE, universities and industry to provide high quality and responsive skills training for critical and emerging industries, including the transformation to a net zero economy.
- The Commonwealth, states and territories have committed to working together through the NETP in a collaborative and integrated way to maximise the economic opportunities offered by the clean energy transformation, ensure reliable and affordable electricity, and deliver the greatest benefits for Australian households, business, and communities.

As it is a dynamic environment, effective coordination of initiatives and actions will need to be ongoing and collaborative to be effective. Stakeholder consultation to date has highlighted the significant amount of activity in the clean energy workforce space. Suggested areas of focus for the NEWS include:

- Coordinated and national effort to increase worker mobility across jurisdictions. This could include improving consistency, or recognition of, critical clean energy occupations subject to licensing arrangements.
- Improved data and information sharing across stakeholders. This could lead to better workforce and project mapping, linking timeframes for large-scale clean energy projects with expected workforce demand and necessary skills.
- Reviewing current governance structures for policy development and advice in key workstreams to ensure a joined up and efficient approach. This could include improved stakeholder engagement mechanisms or establishing new forums.

Consultation Questions

1. What clean energy workforce policy/planning coordination do you think is needed nationally and what governance and other arrangements are needed to facilitate necessary coordination?
2. What type of coordination role should the Commonwealth Government play?
3. What resources or information would make it easier to navigate? – including resources for industry, unions, government, and the general public in particular job seekers and students?

Appendix A - Existing measures

Investment in clean energy

The government is building on its previous investments to support the clean energy transformation and grow new low emission industries. This investment is across a range of initiatives aimed at powering Australia with clean, cheap, and reliable renewable energy supported by storage, firming, gas generation and transmission investment. It is also capitalising on Australia's renewable energy and other comparative advantages by building new industries such as clean energy manufacturing, hydrogen, and critical minerals, to make Australia a renewable energy superpower. Investments include:

- \$20 billion Rewiring the Nation program to unlock investment in the electricity grid at lowest cost
- Powering the Regions Fund to support regional industry transition to net zero
- Development of the National Energy Performance Strategy (NEPS), supported by \$1.7 billion for energy performance upgrades for homes, businesses, local government and social housing. The NEPS identifies the importance of ensuring a skilled workforce to support demand side measures such as energy efficiency, electrification and demand flexibility, with the NEWS as a supporting action.
- The Capacity Investment Scheme, to underwrite 32 GW of new renewable and storage capacity.
- Development of the Net Zero Plan, Review of the National Hydrogen Strategy, National Electric Vehicles Strategy, First Nations Clean Energy Strategy, Australian Offshore Wind Industry Development Plan and others.

The government is also investing \$22.7 billion over the next decade to build a Future Made in Australia and make Australia a renewable energy superpower – building on our projected comparative advantage in low-cost, abundant renewables to position Australia's economy to thrive in a net zero world. This includes:

- A \$1.7 billion Future Made in Australia Innovation Fund to support innovation, commercialisation, pilot and demonstration projects and early-stage development in priority sectors including renewable hydrogen, green metals, low carbon liquid fuels and clean energy manufacturing.
- The Critical Minerals Production Tax Incentive will provide a production incentive valued at 10 per cent of relevant processing and refining costs for Australia's 31 critical minerals
- The Hydrogen Production Tax Incentive will provide an incentive of \$2 per kilogram of renewable hydrogen produced for up to 10 years per project, between 2027-28 and 2039-40 for projects that reach final investment decisions by 2030.
- The government is also expanding the Hydrogen Headstart program with an additional \$1.3 billion over 10 years (and an average of \$151.6 million per year from 2034–35 to 2038–39), supporting early movers to invest in the industry's development.
- \$91 million to accelerate the development of the clean energy workforce through expanded access to the new energy apprenticeship program and investment in Vocational Education and Training (VET) clean energy courses.

Supporting communities

The government is establishing a legislated Net Zero Economy Authority pending Parliamentary processes. [Bills establishing the Authority passed the House of Representatives on 4 June 2024](#). An early focus of the Authority is the regions undergoing transformation now, or imminently, driven by scheduled coal-fired power station closures and major new investments.

The NZEA aims to:

- catalyse and facilitate investment in new industries and jobs in emissions-intensive regions
- support workers impacted by the net zero transformation and take advantage of new opportunities through the implementation of the Energy Industry jobs Plan, particularly workers in ageing and increasingly unreliable coal power-stations and dependent mines.
- help coordinate policy and program design and delivery for an orderly and positive net zero economic transformation, through advice to government and by working on-the-ground in key regions
- build community understanding, confidence and engagement with net zero economic transformation.

The Authority will administer the Energy Industry Jobs Plan to support employees of closing coal and gas-fired power stations, and dependent suppliers (such as dependent coal mines), to move directly into new employment.

It will also work with DEWR to support workers, families and broader communities in affected regions by implementing Regional Workforce Transition Plans in collaboration with state and local government, industry, unions and communities.

Net Zero Plan

The Government is developing a Net Zero Plan, which will articulate how Australia will transition to a net zero economy by 2050, consistent with our international and domestic commitments and our national interest. The Plan will identify new policies and programs to support Australia's decarbonisation pathway. This plan will be informed by six Sectoral Plans to reduce emissions across agriculture and land, electricity and energy, industry, resources, the built environment and transport; and will focus on the circular economy including cross-cutting issues for all sectors. The Sectoral Plans will assess more detailed pathways to reduce emissions and will feed into the overarching Net Zero Plan.

Growing the skilled workforce will be a key enabler for implementation of the Net Zero Plan. The NEWS will focus primarily on the workforce required for the electricity and energy sector pathway. However, it cuts across, and is an enabler for, other sectors with electrification and changing demand in buildings and transport and industry, and in the development of new export industries.

Investment in skills and training

In recognition of both economy-wide shortages of skilled workers, and shortages specific to the clean energy sector, the government, together with states and territories, are investing in skills and training. At the Commonwealth level, this is led by DEWR and includes:

- The multi-faceted \$12.6 billion National Skills Agreement to strengthen the VET sector.
- Establishing a national network of ten (10) Jobs and Skills Councils to provide industry with a stronger, more strategic voice to ensure Australia’s VET sector delivers better outcomes for learners and employers.
- The Australian Apprentice Incentives System support payments for apprentices and employers.
- The New Energy Apprentice Program support payments for apprentices
- Further investment in clean-energy specific VET, including infrastructure and trainers.
- The Fee-Free TAFE Skills Agreement, making available 500,000 fee-free TAFE and VET places over 2023-2026.
- Building Women’s Careers Program will invest \$55.571 million over the next four years to establish large scale projects and smaller, place-based partnerships to advance structural and cultural change to improve women’s access to flexible and inclusive vocational education and training, and work opportunities.